(12) NACH DEM VERTRAG ÜBER DIE INTERNATIONALE ZUSAMMENARBEIT AUF DEM GEBIET DES PATENTWESENS (PCT) VERÖFFENTLICHTE INTERNATIONALE ANMELDUNG

(19) Weltorganisation für geistiges Eigentum
Internationales Büro

(43) Internationales Veröffentlichungsdatum
3. Juni 2004 (03.06.2004)

PCT

(10) Internationale Veröffentlichungsnummer
WO 2004/047246 A1

(51) Internationale Patentklassifikation[7]: H02B 1/04, H05K 5/00, G02B 6/42

(21) Internationales Aktenzeichen: PCT/EP2003/008173

(22) Internationales Anmeldedatum: 24. Juli 2003 (24.07.2003)

(25) Einreichungssprache: Deutsch

(26) Veröffentlichungssprache: Deutsch

(30) Angaben zur Priorität:
102 17 773.4 18. November 2002 (18.11.2002) DE

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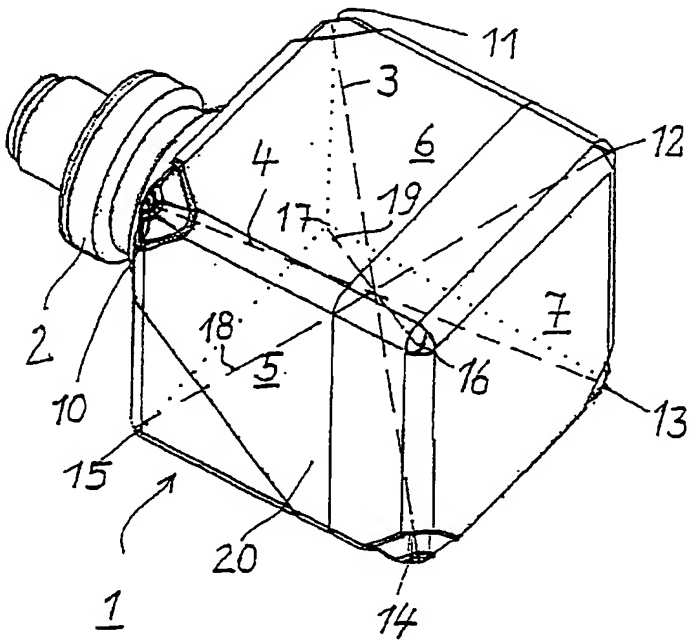
(84) Bestimmungsstaaten *(regional)*: ARIPO-Patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), eurasisches Patent (AM, AZ, BY, KG, KZ, MD, RU, TJ,

[Fortsetzung auf der nächsten Seite]

(54) Title: HOUSING FOR RECEIVING AN ELECTRICAL DEVICE

(54) Bezeichnung: GEHÄUSE ZUR AUFNAHME EINES ELEKTRISCHEN GERÄTES



(57) Abstract: The invention relates to a housing for receiving an electrical device, especially a switching device or a sensor, said housing comprising at least one display unit for displaying different electrical states, especially switching states, of the device. The inventive housing is characterised in that each display unit comprises a plurality of display elements which are arranged opposite each other on the housing in such a way that at least one display element of each display unit is visible from each line of vision.

[Fortsetzung auf der nächsten Seite]

WO 2004/047246 A1

ORIGINAL TRANSLATION OF PCT APPLICATION

APPLICANT NAME: Helm et al.

TITLE: CASING FOR RECEIVING AN ELECTRICAL DEVICE

DOCKET NO.: WEBE-0004

PCT/EP2003/008173
PEPPERL + FUCHS GmbH
P 438 - Hm/fka

CASING FOR RECEIVING AN ELECTRICAL DEVICE

The invention relates to a casing for receiving an electrical device, particularly a switching device or sensor, having at least one indicating or display apparatus for indicating or displaying different electrical states, particularly switching states, of the device, according to the preamble of claim 1.

The invention also relates to a casing for receiving an electrical switching device or sensor with an indicating device for indicating different electrical switching states of the electrical switching device or sensor, said casing being shaped in a substantially cuboid or cubic manner.

Numerous casings for receiving electrical switching devices or sensors are known. The casings have indicating devices for indicating different electrical switching states for monitoring the functionally correct operation of the electrical switching device or sensor. DE 19512915 discloses an electrical connection part with electrically contacting contact pins or female contacts, such as plugs or sockets, which has a reception part in which is placed a light guide member made from transmissive material with at least one illuminant and through which are passed leads for the contact pins. The light guide member has arms, provided on their abutting ends on the side facing the illuminant with in each case a surface plane-inclined or curved

in the direction of the longitudinal axis of the main radiation direction of the illuminant, which in each case form the reflecting deflecting surface of the arm and which are able to deflect the light mainly in the axial direction within the particular arm at an angle between approximately 40° and 140°, preferably at right angles to the main radiation direction thereof. The reflecting deflecting surfaces of the arms collide in each case in the axis of the main radiation direction of the illuminant in a point or edge directed towards the light guide member. Below the point or edge the light guide member has a recess in which is located the illuminant.

This apparatus like most of the known casings suffer from the disadvantage that despite indicating the switching state of the electrical switching device or sensor the switching state cannot be seen to the same extent from all spatial directions, so that in certain circumstances a fault or a malfunction of the electrical switching device or of the sensor can occur without it being immediately noticed by an operator.

The object of the invention is to provide a casing of the aforementioned type in which the electrical states, i.e. in particular the switching states, can be particularly reliably monitored by an operator.

According to a further aspect of the invention, a second solution is that with a casing for receiving an electrical switching device or sensor of the aforementioned type for indicating different switching states of the electrical switching device or sensor, in those corners or angles which each are located on the same space diagonal, the casing has identical indicating devices. The indicating devices differing on different space diagonals, so that from each viewing

direction on the casing it is always in each case possible to see one of the indicating devices for each of the different switching states to be indicated of the electrical switching device or sensor. On viewing one of the surfaces of the casing, as a result of this arrangement it is possible to see an indicating device from each spatial direction.

An important advantage of the invention is that the indicating device for indicating different electrical switching states or switching positions or switching states of the switching device or sensor can be clearly detected from each spatial direction.

If e.g. a power-on indication and a further, different function switching state of the electrical switching device or sensor are to be indicated, the casing comprises for a first indication, e.g. for the power-on indication, as well as for a further, different indication, such as for indicating a switching state of the electrical switching device or sensor, in each two corners or angles, which are in each case located on the same space diagonal of two space diagonals, identical indicating devices. Said indicating devices on different space diagonals are different, so that from each viewing direction on the casing always in each case two indicating devices with different signalling are visible, which form an indication pair, e.g. namely in each case for power-on and a function switching state of the electrical switching device or sensor.

If e.g. a power-on indication and two further, different function switching states of the electrical switching device or sensor are to be indicated the casing comprises, for a first indication, e.g. for power-on indication, as well as for a second indication, such as for indicating a first switching state, as well as for a third indication, such as for indicating

a second switching state of the electrical switching device or sensor, in each three corners or angles, which are in each case located on the same space diagonal of three space diagonals, identical indicating devices. Said indicating devices on different space diagonals are different, so that from each viewing direction on the casing always in each case three indicating devices with different signalling are visible, which form an indication triple, e.g. namely in each case for power-on and two different function switching states of the electrical switching device or sensor.

If e.g. a power-on indication and three further, different function switching states of the electrical switching device or sensor are to be indicated, the casing comprises, for a first indication, e.g. for power-on indication, as well as for a second indication, such as for indicating a first switching state, as well as for a third indication, such as for indicating a second switching state, as well as for a fourth indication, such as for indicating a third switching state of the electrical switching device or sensor, in in each case four corners or angles, which are in each case located on the same space diagonal of four space diagonals, identical indicating devices. Said indicating devices on different space diagonals are different, so that from each viewing direction on the casing always in each case four of the indicating devices with different signalling are visible, which form a indication quadruple, e.g. namely in each case for power-on and three different function switching states of the electrical switching device or sensor.

According to a further development the indicating devices can be incandescent lamps or light emitting diodes, which emit light of different colours and which can consequently be differentiated,

those indicating devices located on the same space diagonal emitting isochromatic light, but those indicating devices located on different space diagonals emitting light with different colours.

According to a further development of the invention, within the casing and in those corners where indicating devices are located, there are viewing windows behind which is in each case positioned a light emitting diode or incandescent lamp.

Thus, the indicating device or a plurality of indicating devices can always be detected from all spatial directions, because when the operator views one or more of the boundary surfaces of the cubic or cuboid casing, in the presence of only one function indicating device, he is always able to see one of the two indicating devices. In this case a distinction can e.g. only be made between power-on and power-not-on.

If the device has two different function indicating devices, they form an indication pair, e.g. power-on and power-not-on and the switching state-s and the switching state-not-s and once again in each case one indication pair can be seen from each spatial direction and can be distinguished by different signalling, such as differently coloured light.

If the device has three different function indicating devices, they form an indication triple, e.g. power-on and power-not-on, switching state-s and switching state-not-s, as well as switching state-t and switching state-not-t and once again in each case one indication triple can be seen from each spatial direction and can be differentiated by different signalling, such as differently coloured light.

If the device has four different function indicating devices, they form an indication quadruple, e.g. power-on and power-not-on, switching state-s and switching state-not-s, switching state-t and switching state-not-t as well as switching state-r and switching state-not-r and once again in each case one indication quadruple can be seen from each spatial direction and can be differentiated by different signalling, such as differently coloured light.

An embodiment of the invention is illustrated by the drawings, wherein show:

Fig. 1 a perspective view of a cubic casing for receiving an electrical switching device or sensor, said casing having two different function indicating devices, which together form an indication pair and

Fig. 2 a view of the cubic casing of fig. 1 turned by 180° to illustrate the fact that always one indication pair of different function indications can be seen from each spatial direction.

The casing 1 shown in figs. 1 and 2 is a cube, which is bounded by its boundary surfaces 5, 6, 7, 8, 9 and 20 and has the angles or corners 10, 11, 12, 13, 14, 15, 16 and 17. Between the corners 10-13, 11-14, 12-15 and 16-17 the space diagonals 4, 3, 18 and 19 extend respectively. On the boundary surface 8 is located a mounting flange 2, which is e.g. used for flanging the casing 1 to a not shown mounting base, which for this purpose has a suitable opening for receiving the mounting flange 2.

The casing 1 shown in figs. 1 and 2 is such that it is able to indicate or display two different switching states; for example,

the casing 1 is used for a power-on indication and for indicating a further switching state of the electrical switching device or sensor. To this end the casing 1 is provided in two corners 10-13, which are located on the same space diagonal 4, in each case with an indicating apparatus having two identical indicating devices 10 and 13. Further, in the two corners 11-14 located on the same space diagonal 4, the casing 1 has a further indicating apparatus with two identical indicating devices 11 and 14. However, the indicating devices on the different space diagonals 3 and 4 differ, so that they can be distinguished. So directly adjacent indicating devices 10-11 and 13-14 in each case form an indication pair with different signalling of states and of the two indication pairs 10-11, 13-14 respectively, it is always possible to see one indication pair 10-11 or 13-14 from each viewing direction on the casing 1.

One indication pair of the indicating devices can e.g. comprise different light emitting diodes 10, 11, 13, 14, the diagonally facing light emitting diodes 10, 13 in the diagonally facing corners 10, 13 of the casing 1 e.g. emitting light in the red spectrum. The diagonally facing light emitting diodes 11, 14 in the diagonally facing corners 11, 14 however emit light in the green spectrum, so that in this way it is possible to distinguish the different functional states of the electrical switching device or sensor within the casing 1.

Fig. 2 also shows that each corner in which an indicating device is located, such as in corner 11 indicating device 11, is covered with a translucent viewing window 21, behind which is located the indicating device in the form of a light emitting diode 11.

REFERENCE NUMERALS LIST

1	Cubic casing
2	Mounting flange
3, 4, 18, 19	Space diagonals
5, 6, 7, 8, 9	Top surfaces of the casing
10, 11, 13, 14	Indicating devices and simultaneously corners of the casing
15, 16, 17	Remaining corners of the casing
21	Translucent viewing window

CLAIMS

1. Casing (1) for receiving an electrical device, particularly a switching device or sensor,
having at least one indicating apparatus for indicating different electrical states, particularly switching states, of the device,
c h a r a c t e r i z e d in that
each indicating apparatus has a plurality of indicating devices (10, 11, 13, 14) and
that the indicating devices (10, 13; 11, 14) of an indicating apparatus are positioned facing one another on the casing (1) in such a way that from each viewing direction at least one indicating device (10, 11, 13, 14) of each indicating apparatus is visible.

2. Casing (1) for receiving an electrical switching device or sensor with an indicating device for indicating different electrical switching states of the electrical switching device or sensor, particularly according to claim 1, said casing having a substantially cuboid or cubic shape, wherein for indicating different switching states of the electrical switching device or sensor, the casing is provided in those corners (10, 11, 12, 13, 14, 15, 16, 17) which are in each case located on the same space diagonal (3, 4, 18, 19) with identical indicating devices (10-13, 11-14), the indicating devices (10, 11, 13, 14) on different space diagonals (3, 4, 18, 19) differing, so that from each viewing direction on the casing (1) always in each case one of the indicating devices (10, 11, 13, 14) for each of the different switching states to be indicated of the electrical switching device or sensor is visible.

3. Casing according to claim 1 or 2,
c h a r a c t e r i z e d in that
for a first indication, e.g. for power-on indication, as well as for a second indication, such as for indicating a further switching state of the electrical switching device or sensor, the casing (1) has in in each case two corners (10, 11, 12, 13, 14, 15, 16, 17), which are in each case located on the same space diagonal (3, 4) of two space diagonals (3, 4), identical indicating devices (10-13, 11-14), the indicating devices (10, 11, 13, 14) on different space diagonals (3, 4, 18) differing, so that from each viewing direction on the casing (1) always in each case two of the indicating devices (10, 11, 13, 14) with different signalling are visible, which form an indication pair, e.g. namely in each case for power-on and a function switching state of the electrical switching device or sensor.

4. Casing according to one of the claims 1 to 3,
c h a r a c t e r i z e d in that
for a first indication, e.g. for power-on indication, as well as for a second indication, such as for indicating a first switching state, as well as for a third indication, such as for indicating a second switching state of the electrical switching device or sensor, the casing (1) has in in each case three corners (10, 11, 12, 13, 14, 15, 16, 17), which are in each case located on the same space diagonal (3, 4, 18) of three space diagonals (3, 4, 18), identical indicating devices (10-13, 11-14), the indicating devices (10, 11, 13, 14) on different space diagonals (3, 4, 18) differing, so that from each viewing direction on the casing (1) always in each case three of the indicating devices (10, 11, 13, 14) with different signalling are

visible, which form an indication triple, e.g. namely in each case for power-on and two different function switching states of the electrical switching device or sensor.

5. Casing according to one of the claims 1 to 4, c h a r a c t e r i z e d in that for a first indication, e.g. for power-on indication, as well as for a second indication, such as for indicating a first switching state, as well as for a third indication, such as for indicating a second switching state, as well as for a fourth indication, such as for indicating a third switching state of the electrical switching device or sensor, the casing (1) has in in each case four corners (10, 11, 12, 13, 14, 15, 16, 17), which are in each case located on the same space diagonal (3, 4, 18) of four space diagonals (3, 4, 18), identical indicating devices (10-13, 11-14), the indicating devices (10, 11, 13, 14) on different space diagonals (3, 4, 18) differing, so that from each viewing direction on the casing (1) always in each case four of the indicating devices (10, 11, 13, 14) with different signalling are visible, which form an indication quadruple, e.g. namely for power-on and three different function switching states of the electrical switching device or sensor.

6. Casing according to one of the preceding claims, c h a r a c t e r i z e d in that the indicating devices (10-13, 11-14) are incandescent lamps or light emitting diodes, which emit light in different colours and which can consequently be differentiated, those indicating devices (10-13, 11-14) located on the same space diagonal (3, 4) emitting isochromatic light, whereas those indicating devices (10-

13, 11-14) located on different space diagonals (3, 4) emitting differently coloured light.

7. Casing according to one of the preceding claims, c h a r a c t e r i z e d in that within the casing (1), in those corners (10, 11, 12, 13, 14, 15, 16, 17) in which indicating devices (10-13, 11-14) are located, translucent viewing windows are provided and behind which is in each case positioned a light emitting diode (10-13, 11-14) or incandescent lamp.

ABSTRACT

The invention relates to a casing for receiving an electrical device, particularly a switching device or sensor, having at least one indicating apparatus for indicating different electrical states, particularly switching states, of the device. The casing is characterized in that each indicating apparatus has a plurality of indicating devices and that the indicating devices of one indicating apparatus are positioned facing one another on the casing in such a way that, from each viewing direction, at least one indicating device of each indicating apparatus can be seen.

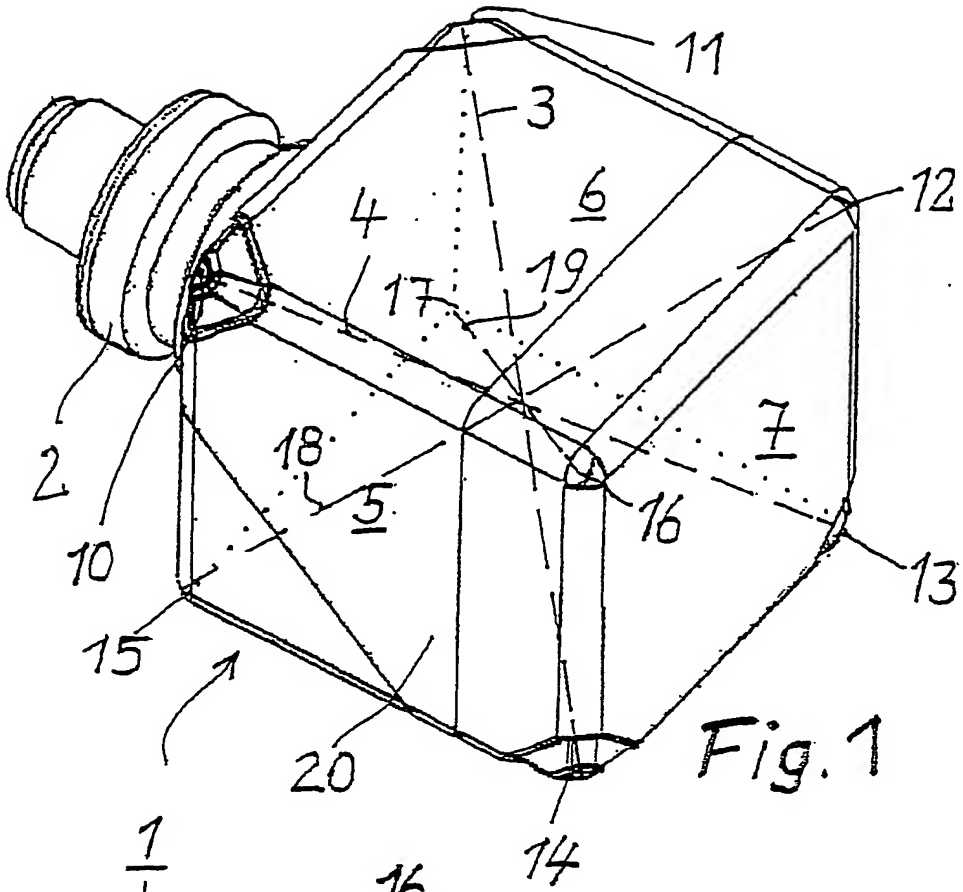


Fig. 1

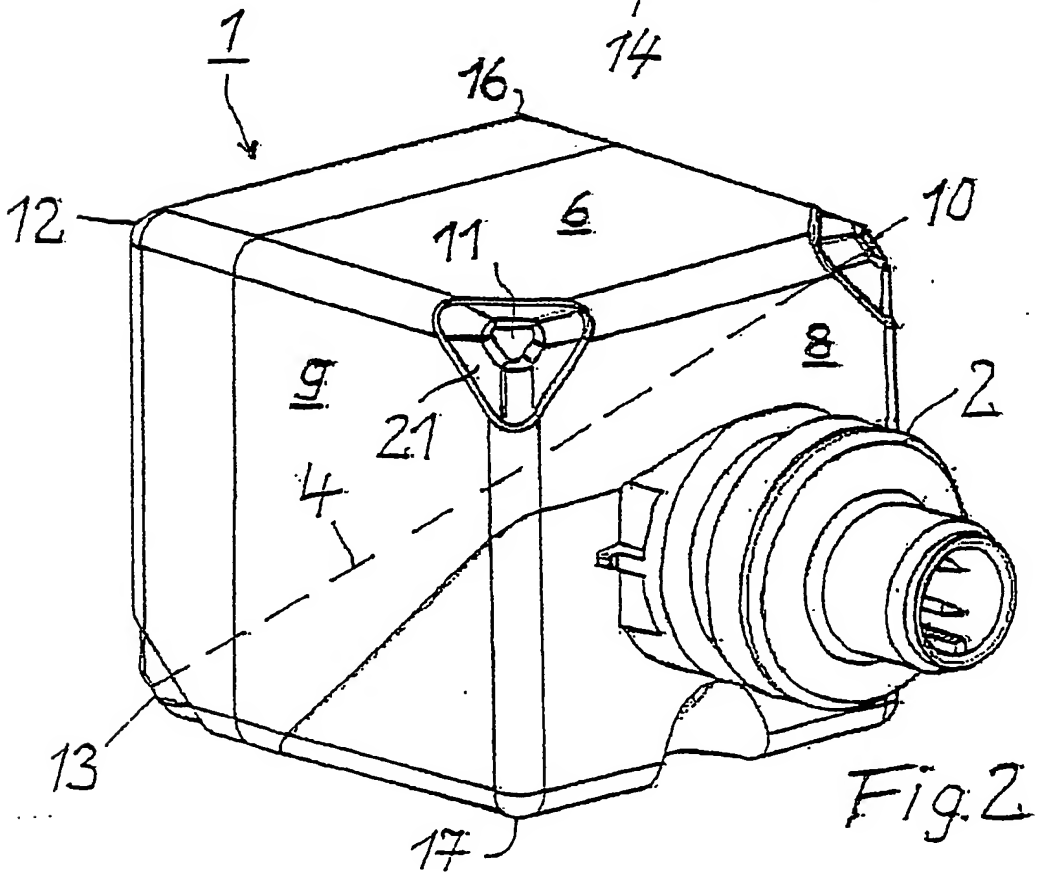


Fig. 2